

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

I. Introduction

As a preliminary matter, Applicants note the Office Action's acknowledgement of receipt of papers submitted under 35 U.S.C. § 119(a)-(d) and consideration of the Information Disclosure Statements submitted on May 27, 2005 and September 15, 2005.

By this amendment, claim 1 has been amended for clarity and to further define the subject matter Applicants regard as the invention. New claims 2-12 have been added. Support for the amendments to the claims can at least be found on pages 11-13; page 14, lines 7-15; and page 27, lines 1-4 of the present specification.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. Thus, claims 1-12 are presently pending in this application for consideration.

II. The Objection Should Be Withdrawn

Claim 1 stands objected to as being narrative and indefinite and for failing to conform to U.S. practice. Claim 1 has been amended to remove any grammatical and idiomatic errors and for clarity. Applicants respectfully submit that claim 1 is in proper form and conforms to current U.S. practice. Withdrawal of the objection to claim 1 is respectfully requested.

III. The Rejection Should Be Withdrawn

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,872,330 to Miller et al. (hereinafter "Miller") in view of U.S. Patent No. 6,528,925 to Takeuchi et al. (hereinafter "Takeuchi").

Applicants respectfully submit that independent claim 1 is patentably distinguishable over the cited references as required by §103. Applicants further submit that the cited references, whether considered alone or in combination, fail to disclose Applicants' claimed driver for a plurality of piezoelectric actuators that includes: (1) *piezoelectric actuators directly connected through the positive and negative side feeder lines* and (2) *a controller to selectively on-control and charge the second or the first piezoelectric sheet by applying a drive voltage to the first and the second piezoelectric sheets, by selectively connecting the positive side or the negative side feeder line to the plate side of the first or the second piezoelectric sheet* as required by independent claim 1. In contrast, the cited references fail to disclose, teach or suggest these claimed features. Accordingly, independent claim 1 and claims dependent therefrom are patentably distinguishable over the cited references. These distinctions will be further described below.

An embodiment of the present invention pertains to a driver for a plurality of piezoelectric actuators with the plurality of piezoelectric actuators having a first and a second piezoelectric sheet attached to opposed surfaces of a plate interposed between the first and the second piezoelectric sheets. The driver includes a plurality of actuators mechanically moving a mechanical component directly or indirectly connected to each of the piezoelectric actuators. A positive side feeder line is directly connected in common to a side of the first piezoelectric sheet opposite to the side attached to the plate and a negative side feeder line is directly connected in common to a side of the second piezoelectric sheet opposite to the side attached to the plate. One aspect of the present invention includes a controller to selectively on-control and charge the second or the first piezoelectric sheet by applying a drive voltage to the first and the second piezoelectric sheets, by selectively connecting the positive side or the negative side feeder line to the plate side of the first or the second piezoelectric sheet.

Another aspect of the present invention includes the controller having a function to off-control the drive voltage applied to the first or the second piezoelectric sheet of each of the piezoelectric actuators selected to be on-controlled, and to simultaneously on-control the first or the second piezoelectric sheet of any other of the piezoelectric actuators next so as to apply the drive voltage thereto. Therefore, a discharging current is allowed to flow from the first or the second piezoelectric sheet of any one of the piezoelectric actuators subjected to

off-control and the first or the second piezoelectric sheet of any other one of the piezoelectric actuators subjected to on-control is directly charged through the positive side or the negative side feeder line.

Miller relates to a high power acoustic transducer with an elastic wave amplification. Miller appears to disclose the claimed plurality of piezoelectric actuators and plural actuators but contrary to the Examiner's assertion, Miller fails to disclose the claimed arrangement of *piezoelectric actuators directly connected through the positive and negative side feeder lines*. As illustrated in Fig. 7, one of the ends of each of the piezoelectric actuators (11a, 11b, 11c) is connected to the positive side feeder line but the other end of each of the piezoelectric actuators is connected to ground. In addition, as the Office Action correctly points out on page 3, there is no disclosure in Miller of the claimed controller *to selectively on-control and charge the second or the first piezoelectric sheet by applying a drive voltage to the first and the second piezoelectric sheets, by selectively connecting the positive side or the negative side feeder line to the plate side of the first or the second piezoelectric sheet*. The Office Action alleges that Takeuchi cures this deficiency.

Takeuchi generally describes in its background section, conventional circuits for charging and discharging piezoelectric elements using capacitors and coils (column 1, lines 28-43). Takeuchi, however, fails to disclose, teach or suggest, *a controller to selectively on-control and charge the second or the first piezoelectric sheet by applying a drive voltage to the first and the second piezoelectric sheets, by selectively connecting the positive side or the negative side feeder line to the plate side of the first or the second piezoelectric sheet* as specifically recited in independent claim 1. This is simply not shown or discussed in the reference.

In addition, there is no motivation to combine Miller and Takeuchi in the manner suggested by the Office Action. The Office Action appears to rely solely on the Applicants' disclosure for motivation to modify the reference to arrive at the invention relating to a driver for a plurality of piezoelectric actuators. The Office Action cites nothing in the prior art that provides motivation to modify the reference to arrive at the invention of independent claim 1.

Applicants submit that the motivation proffered in the Office Action to combine the references is not sufficient. The Office Action states a result of general implementation of the references: combining the references “power consumption is reduced.” However, Applicants respectfully submit that a *result* is not the same as *a reason why* one of ordinary skill in the art would be motivated to combine the references, however desirable those results may be. If motivation to combine references to establish a *prima facie* case of obviousness could merely be satisfied by a result-oriented analysis of the prior art, the first requirement (and second requirement) of MPEP § 2143 would be completely vitiated. This is because by identifying references that teach each individual element of a claimed invention, implementation of the teachings of the cited references almost always necessarily provides results according to a given invention under examination. Indeed, such an analysis relies on impermissible circular reasoning.

Furthermore, even if there was motivation to combine Miller and Takeuchi, the combined device still would not meet every limitation of independent claim 1. There is simply no suggestion in any of the cited references of (1) *piezoelectric actuators directly connected through the positive and negative side feeder lines* and (2) *a controller to selectively on-control and charge the second or the first piezoelectric sheet by applying a drive voltage to the first and the second piezoelectric sheets, by selectively connecting the positive side or the negative side feeder line to the plate side of the first or the second piezoelectric sheet*. Without such a suggestion in the prior art, Applicants claimed invention cannot properly be deemed obvious.

For the reasons set forth above, Applicants respectfully submit that claim 1 is patentably distinguishable over Miller in view of Takeuchi as required by 35 U.S.C. § 103. Withdrawal of this rejection is respectfully requested.

In view of the fact that Miller and Takeuchi do not disclose each of the claimed features, whether considered alone or in combination, these references cannot be said to render obvious the invention which is the subject matter of independent claim 1. Thus, independent claim 1 is considered allowable. Since independent claim 1 is allowable, new

claims 2-12 are considered allowable by virtue of their direct or indirect dependence from independent claim 1 and for containing other patentable features.

IV. Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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